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Information technology — Data protocol for radio frequency identification (RFID) for item management —

Part 1: Application interface

Technologies de l'information — Protocole de données relatif à l'identification par radiofréquence (RFID) pour la gestion d'objets —

Partie 1: Interface d'application

Reference number
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Contents

Page

Foreword ... **viii**

Introduction ... **ix**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms and definitions ... 1
3.2 Abbreviated terms and designations ... 2

4 Conformance ... **2**
4.1 General ... 2
4.2 Application conformance ... 2
4.3 Conformance of the Data Processor ... 3

5 Protocol model ... **3**

6 Presentation conventions ... **3**
6.1 Commands, responses, and arguments ... 3
6.1.1 General ... 3
6.1.2 Data types ... 3
6.2 Object Identifier presentation in the application interface ... 4
6.2.1 Object identifier structure to ISO/IEC 8824-1 ... 4
6.2.2 Presenting the Object-Identifier in accordance with ISO/IEC 8824-1 ... 5
6.2.3 Presenting the Object-Identifier as a Uniform Resource Name (URN) ... 5
6.3 Byte notation ... 5
6.3.1 Byte — Basic unit for 8-bit coding ... 5
6.3.2 Bit ordering ... 5
6.3.3 Byte conversion ... 6

7 Processing application commands and responses ... **6**
7.1 General ... 6
7.1.1 Option A: Straight through process ... 6
7.1.2 Option B: Transfer encoding ... 6
7.2 Encoding system related information in commands ... 7
7.2.1 Singulation-Id ... 7
7.2.2 AFI ... 7
7.2.3 DSFID ... 7
7.2.4 Access-Method ... 8
7.2.5 Data-Format ... 9
7.3 Preparing the basic Objects and other application-based arguments ... 10
7.3.1 General ... 10
7.3.2 General model ... 11
7.3.3 Object-Identifier ... 11
7.3.4 Relating Object-Identifiers ... 11
7.3.5 Object ... 11
7.3.6 Compact-Parameter ... 12
7.3.7 Object-Lock ... 14
7.4 Other command arguments ... 14
7.4.1 Access-Password ... 14
7.4.2 Additional-App-Bits ... 14
7.4.3 AFI-Lock ... 14
7.4.4 Append-To-Existing-Multiple-Record ... 14
7.4.5 Application-Defined-Record-Capacity ... 15
7.4.6 Avoid-Duplicate ... 15
7.4.7 Battery-Assist-Indicator ... 15
7.4.8 Block-Align ... 15
7.4.9 Block-Align-Packed-Object ... 15

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7.4.10 Check-Duplicate 15
7.4.11 Data-CRC-Indicator 15
7.4.12 Data-Length-Of-Record 16
7.4.13 Delete-MR-Method 16
7.4.14 Directory-Length-EBV8-Indicator 16
7.4.15 DSFID-Lock 16
7.4.16 DSFID-Pad-Bytes 16
7.4.17 Editable-Pointer-Size 16
7.4.18 Encoded-Memory-Capacity 17
7.4.19 EPC-Code 17
7.4.20 Full-Function-Sensor-Indicator 17
7.4.21 Hierarchical-Identifier-Arc 17
7.4.22 Identifier-Of-My-Parent 17
7.4.23 Identify-Method 17
7.4.24 ID-Type 17
7.4.25 Instance-Of-Arc 18
7.4.26 Kill-Password 18
7.4.27 Length-Of-Mask 18
7.4.28 Lock-Directory-Entry 18
7.4.29 Lock-Multiple-Records-Header 18
7.4.30 Lock-Record-Preamble 18
7.4.31 Lock-UII-Segment-Arguments 18
7.4.32 Max-App-Length 18
7.4.33 Memory-Bank 19
7.4.34 Memory-Bank-Lock 19
7.4.35 Memory-Length-Encoding 19
7.4.36 Memory-Segment 19
7.4.37 Memory-Type 19
7.4.38 Multiple-Records-Directory-Length 19
7.4.39 Multiple-Records-Features-Indicator 19
7.4.40 NSI-Bits 20
7.4.41 Number-In-Data-Element-List 20
7.4.42 Number-Of-Records 20
7.4.43 Number-Of-Tags 20
7.4.44 Objects-Offsets-Multiplier 20
7.4.45 Packed-Object-Directory-Type 20
7.4.46 Password 21
7.4.47 Password-Type 21
7.4.48 PO-Directory-Size 21
7.4.49 PO-Index-Length 21
7.4.50 Pointer 21
7.4.51 Pointer-To-Multiple-Records-Directory 21
7.4.52 Read-Record-Type 21
7.4.53 Read-Type 23
7.4.54 Record-Memory-Capacity 23
7.4.55 Record-Type-Arc 23
7.4.56 Record-Type-Classification 24
7.4.57 Sector-Identifier 24
7.4.58 Simple-Sensor-Indicator 24
7.4.59 Start-Address-Of-Record 24
7.4.60 Tag-Data-Profile-ID-Table 24
7.4.61 Tag-Mask 25
7.4.62 Update-Multiple-Records-Directory 25
7.4.63 Word-Count 25
7.4.64 Word-Pointer 25
7.5 Command-related field names 25
7.5.1 General 25
7.5.2 Data-Set 25

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7.5.3 Identities ... 25
7.5.4 Length-Lock Byte ... 25
7.5.5 Length-Of-Encoded-Data ... 26
7.5.6 Lock-Status ... 26
7.5.7 Logical-Memory-Map ... 26
7.5.8 Memory-Capacity ... 26
7.5.9 Module-OID ... 26
7.5.10 Number-Of-Tags-Found ... 26
7.5.11 PO-ID-Table ... 26
7.5.12 Protocol-Control-Word ... 26
7.5.13 Read-Data ... 26
7.6 Data security ... 26

8 Dataflows and processes to the air interface ... 27
8.1 General ... 27
8.2 Establishing communications between the application and the tag ... 27
8.2.1 General ... 27
8.2.2 Air interface services ... 27
8.2.3 System information ... 27
8.3 Application system services ... 28

9 Command-Codes, Completion-Codes, and Execution-Codes ... 28
9.1 General ... 28
9.2 Final arc values of the command and response modules ... 28
9.3 Completion-Code ... 30
9.4 Execution-Code ... 30

10 Commands and responses ... 30
10.1 General ... 30
10.2 Configure-AFI ... 30
10.2.1 Configure-AFI command ... 30
10.2.2 Configure-AFI response ... 31
10.3 Configure-DSFID ... 32
10.3.1 General ... 32
10.3.2 Configure-DSFID command ... 32
10.3.3 Configure-DSFID response ... 32
10.4 Inventory-Tags ... 33
10.4.1 Inventory-Tags command ... 33
10.4.2 Inventory-Tags response ... 34
10.5 Delete-Object ... 35
10.5.1 Delete-Object command ... 35
10.5.2 Delete-Object response ... 36
10.6 Modify-Object ... 36
10.6.1 Modify-Object command ... 36
10.6.2 Modify-Object response ... 37
10.7 Read-Object-Identifiers ... 38
10.7.1 Read-Object-Identifiers command ... 38
10.7.2 Read-Object-Identifiers response ... 38
10.8 Read-Logical-Memory-Map ... 39
10.8.1 Read-Logical-Memory-Map command ... 39
10.8.2 Read-Logical-Memory-Map response ... 39
10.9 Erase-Memory ... 40
10.9.1 Erase-Memory command ... 40
10.9.2 Erase-Memory response ... 40
10.10 Get-App-Based-System-Info ... 41
10.10.1 Get-App-Based-System-Info command ... 41
10.10.2 Get-App-Based-System-Info response ... 41
10.11 Write-Objects ... 41
10.11.1 Write-Objects command ... 41

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10.11.2 ....
Write-Objects response ... 43
10.12 Read-Objects ... 44
10.12.1 ....
Read-Objects command ... 44
10.12.2 ....
Read-Objects response ... 45
10.13 Write-Objects-Segmented-Memory-Tag ... 46
10.13.1 Write-Objects-Segmented-Memory-Tag command ... 46
10.13.2 ....
Write-Objects-Segmented-Memory-Tag response ... 47
10.14 Write-EPC-UII ... 48
10.14.1 Write-EPC-UII command ... 48
10.14.2 Write-EPC-UII response ... 49
10.15 Inventory-ISO-UIImemory ... 49
10.15.1 Inventory-ISO-UIImemory command ... 49
10.15.2 ....
Inventory-ISO-UIImemory response ... 50
10.16 Inventory-EPC-UIImemory ... 50
10.16.1 Inventory-EPC-UIImemory command ... 50
10.16.2 ....
Inventory-EPC-UIImemory response ... 51
10.17 Write-Password-Segmented-Memory-Tag ... 51
10.17.1 Write-Password-Segmented-Memory-Tag command ... 51
10.17.2 Write-Password-Segmented-Memory-Tag response ... 51
10.18 Read-Words-Segmented-Memory-Tag ... 52
10.18.1 Read-Words-Segmented-Memory-Tag command ... 52
10.18.2 ....
Read-Words-Segmented-Memory-Tag response ... 52
10.19 Kill-Segmented-Memory-Tag ... 53
10.19.1 Kill-Segmented-Memory-Tag command ... 53
10.19.2 Kill-Segmented-Memory-Tag response ... 53
10.20 Delete-Packed-Object ... 54
10.20.1 ....
Delete-Packed-Object command ... 54
10.20.2 ....
Delete-Packed-Object response ... 54
10.21 Modify-Packed-Object-Structure ... 55
10.21.1 ....
Modify-Packed-Object-Structure command ... 55
10.21.2 ....
Modify-Packed-Object-Structure response ... 56
10.22 Write-Segments-6TypeD-Tag ... 56
10.22.1 ....
Write-Segments-6TypeD-Tag command ... 56
10.22.2 ....
Write-Segments-6TypeD-Tag response ... 58
10.23 Read-Segments-6TypeD-Tag ... 59
10.23.1 ....
Read-Segments-6TypeD-Tag command ... 59
10.23.2 ....
Read-Segments-6TypeD-Tag response ... 60
10.24 Write-Monomorphic-UII ... 61
10.24.1 ....
Write-Monomorphic-UII command ... 61
10.24.2 ....
Write-Monomorphic-UII response ... 63
10.25 Configure-Extended-DSFID ... 63

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10.25.1
General 63
10.25.2
Configure-Extended-DSFID command 64
10.25.3
Configure-Extended-DSFID response 64
10.26 Configure-Multiple-Records-Header 65
10.26.1
General 65
10.26.2
Configure-Multiple-Records-Header command 65
10.26.3
Configure-Multiple-Records-Header response 67
10.27 Read-Multiple-Records 68
10.27.1 Read-Multiple-Records command 68
10.27.2 Read-Multiple-Records response 69
10.28 Delete-Multiple-Record 69
10.28.1
Delete-Multiple-Record command 69
10.28.2
Delete-Multiple-Record response 70

11 Arguments 71
11.1 Add-Objects 71
11.2 DSFID-Constructs 71
11.3 EPC-UIImemory 72
11.4 Ext-DSFID-Constructs 72
11.5 ISO-UIImemory 73
11.6 Item-Related-Add-Objects 74
11.7 Item-Related-DSFID-Constructs 74
11.8 Multiple-Records-Constructs 74
11.9 Multiple-Records-Directory-Structure 75
11.10 Multiple-Records-Header-Structure 76
11.11 Multiple-Records-Preamble-Structure 77
11.12 Packed-Object-Constructs 78
11.13 Read-Objects 79
11.14 Read-Objects-Response 79
11.15 Read-OIDs-Response 80
11.16 UII-Add-Objects 80
11.17 UII-DSFID-Constructs 80
11.18 Write-Responses 80

Annex A (informative) **Abstract syntax and transfer encoding rules of ISO/IEC 15961:2004 82**

Annex B (informative) **Accommodating established data formats 92**

Annex C (informative) **Relating data Objects 94**

Annex D (informative) **Data security issues 96**

Annex E (informative) **Original commands and responses using ASN.1 abstract syntax 98**

Annex F (informative) **Example of a transfer encoding to ISO/IEC 15961:2004 135**

Bibliography 139

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 15961-1:2013), which has been technically revised.

The main changes are as follows:

— Clauses from ISO/IEC 15962 which had been reproduced in this document have been removed and replaced by references to these clauses.

— The requirement for backwards compatibility with the 2004 version of this document (ISO/IEC 15961:2004) has been clarified.

— The document was edited for clarity and conformity with ISO/IEC Directives Part 2 drafting rules.

A list of all parts in the ISO/IEC 15961 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The technology of radio frequency identification (RFID) is based on non-contact electronic communication across an air interface. The structure of the bits stored on the memory of the tag is invisible and accessible between the tag and the interrogator only using an air interface protocol, as specified in the appropriate part of ISO/IEC 18000. The result of the transfer of data between an application and an interrogator in open systems requires data to be encoded in a consistent manner on any tag that is part of that open system. This is not only to allow equipment to be interoperable, but in the special case of data carriers, for the data to be encoded on the tag in one system's implementation and to be read at a later time in a completely different and unknown system's implementation. The data bits stored on each tag must be formatted in such a way as to be reliably read at the point of use if the tag is to fulfil its basic objective. This reliability is achieved through the specification of a Data Protocol in this document and the data encoding rules of ISO/IEC 15962. Additionally, ISO/IEC 24791-1 specifies a software system infrastructure architecture that enables RFID system operations between business applications and RFID interrogators. Specific parts of the infrastructure standards address data management requirements (ISO/IEC 24791-2) and device interface requirements (ISO/IEC 24791-5). These support defined implementations that incorporate the encoding rules of ISO/IEC 15962 and the functional rules of the commands and responses in this document.

Manufacturers of RFID equipment (e.g. interrogators, tags) and users of RFID technology require standards-based Data Protocols for RFID for item management. This document, ISO/IEC 15962, ISO/IEC 24791-1, ISO/IEC 24791-2 and ISO/IEC 24791-5 specify these protocols, which are layered above the air interface standards defined in the ISO/IEC 18000 series.

The transfer of data to and from an application, supported by appropriate application commands, is the subject of this document. This document is intended to be used as a reference to develop software appropriate for RFID applications and equipment. ISO/IEC 15962, which is intended to be used with this document, specifies the overall process and the methodologies developed to format the application data into a structure to store on the tag.

NOTE ISO/IEC 15961:2004 is a withdrawn standard, replaced by ISO/IEC 15961-1, ISO/IEC 15961-2, ISO/IEC 15961-3 and ISO/IEC 15961-4. ISO/IEC 15961:2004 is referenced to point out the differences with this document because some systems still use the withdrawn version. All information pertaining to the use of the withdrawn ISO/IEC 15961:2004 is contained in this document. The intention is to remove reference to the withdrawn standard in the next version of this document.

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Information technology — Data protocol for radio frequency identification (RFID) for item management —

Part 1: Application interface

1 Scope

This document focuses on the abstract interface between an application and the data processor and includes the specification and definition of application commands and responses. It allows data and commands to be specified in a standardised way, independent of the ISO/IEC 18000 series air interfaces.

This document:

— provides guidelines on presenting data as objects;

— defines the structure of Object Identifiers, based on ISO/IEC 9834-1;

— specifies the commands that are supported for transferring data between an application and the radio frequency identification (RFID) tag;

— specifies the responses that are supported for transferring data between the tag and the application;

— does not specify any required transfer syntax with ISO/IEC 15962, but provides the non-normative information in Annex A for backward compatibility with the 2004 version of this document (ISO/IEC 15961:2004[1)]).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 15961-3, *Information technology — Data protocol for radio frequency identification (RFID) for item management — Part 3: RFID data constructs*

ISO/IEC 15962, *Information technology — Radio frequency identification (RFID) for item management — Data protocol: data encoding rules and logical memory functions*

ISO/IEC 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762 and the following apply.

1) Withdrawn standard. Replaced by ISO/IEC 15961-1, ISO/IEC 15961-2, ISO/IEC 15961-3 and ISO/IEC 15961-4.

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ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
application
software component that issues commands and receives responses to the commands within a system

3.1.2
data processor
implementation of the processes defined in ISO/IEC 15962, including the data compactor, formatter, logical memory, and command/response unit

Note 1 to entry: This was called "data protocol processor" in ISO/IEC 15961:2004[2)].

3.2 Abbreviated terms and designations

URN uniform resource name

Since "TDS", "Type C" and "Type D" are commonly used in the industry to refer to the technology components as specified by these standards, the following designations are used in this document:

Type C ISO/IEC 18000-63

Type D ISO/IEC 18000-64

TDS GS1 EPC Tag Data Standard

4 Conformance

4.1 General

The commands and responses in this document are expressed in an abstract syntax; transfer encoding, as specified by ISO/IEC 15961 (the superseded 2004 version of this document) is no longer required. As such, conformance to this document is specifically indicated by the resultant proper encoding of tags according to ISO/IEC 15962.

The arguments and fields contained in individual commands and responses identify what needs to be considered for correct input to the Data Processor to achieve a valid encoding. Also, they identify what an application expects to have returned following access to a tag. Because of the way the Data Protocol is structured, the commands and responses specified in this document are, to a large extent, independent of particular tag types that are only known to the Data Processor through the Tag Driver. The result is that ISO/IEC 15962 can specify conformance requirements for valid encoding, which this document cannot.

This clause provides conformance best practice advice to achieve an integrated data communication channel between the application and the tag.

4.2 Application conformance

An application is expected to support the commands and responses that are meaningful to the application. For every command considered relevant for an application, all the constituent components shall be considered in transfers between the application and the Data Processor.

2) Withdrawn standard. Replaced by ISO/IEC 15961-1, ISO/IEC 15961-2, ISO/IEC 15961-3 and ISO/IEC 15961-4.

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